

REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed July 28, 2004.

Upon entry of the amendments in this response, claims 1-36 remain pending. In particular, applicant adds claims 33-36, amends claims 1, 3, 4, 6-8, 10, 12, 14, 16-19, 22 and 30.

Reconsideration and allowance of the application with the presently pending claims are respectfully requested.

I. Rejections Under 35 U.S.C. §112

Claim 1 was rejected under § 112, second paragraph, as being indefinite because of the phrase "and the like." Claim 1 has been modified so as to delete this phrase. Accordingly, the rejection under § 112 should be avoided.

Claim 18 was rejected under § 112 as being indefinite. The language of claim 18 has been modified to avoid the rejection.

II. Claim Objections

Claims 1, 12, 14, 17, 18, 19, 22 and 30 were objected to.

Claims 1 and 19 are objected to because applicant's drawing illustrates strengthening flanges extending *from points* along the length of the structural panel, but the claim language does not necessarily describe this feature.

Claims 1 and 19 describe the strengthening flanges extending along the length of the structural panel. This language of the claims appears to be correct. The Examiner is invited to

call the undersigned attorney for further discussion of this matter if the claim language is not acceptable as presently written.

Claim 12 was objected to because the expression "said retention apertures" has no antecedent. Claim 12 has been amended to depend from claim 10, which provides a proper antecedent.

Claim 14 was objected to because the expression "said strengthening member" has no antecedent. Claim 14 has been amended to depend from claim 2, which provides a proper antecedent.

Claim 17 was objected to as indefinite because the expression "the means for attaching step" has no proper antecedent. The language of the claim has been amended to avoid this rejection.

Claim 18 was objected to because the expression "the means for attaching step" has no antecedent. This language has been modified in claim 18.

Claim 22 was objected to because the claim does not provide units for the dimensions of "0.010." The claim has been modified to include "inches."

Claim 13 was objected to as indefinite because the expressions "said connection means" and "said anchor sheets" have no proper antecedent. The claim has been modified to correct this.

Applicant submits that the objections raised by the Examiner have been obviated by proper response.

III. Rejections Under 35 U.S.C. §103

Claim 1 was rejected under 35 U.S.C. 103(a) as being unpatentable Okimoto, et al. (JP-63 312 413-A) in view of Nottingham (U.S. 2002/0 054 791 A1). The rejection indicates that Okimoto, et al. disclose the features of claim 1 (as recited in the Office Action), and that Okimoto, et al. failed to disclose the sheet pile made from synthetic resin. The rejection indicates that it would have been obvious to modify the sheet pile of Okimoto, et al. with the synthetic resin material of Nottingham because both inventions are related to sheet pile systems for use in construction sites.

Claim 1 specifies that the structural panel is elongated and of constant size and shape along its length and characterized by having been extruded length-wise. Okimoto, et al. appears to be a product produced by welding or other means besides extrusion. The English translation provided with Okimoto, et al. in the Office Action states:

PURPOSE: To make the setting of angular steel sheet pile easier as well as produce the sheet pile economically by using an angular steel tubular sheet pile consisting of an angular steel tube and an *interlocking coupler welded* to both angular ends on one flange of the steel tube.

CONSTITUTION: The same kinds of interlocking couplers 30a and 30b are *welded* to both angular ends on one flange 28a side of an angular steel tube 27 of a rectangular, square, or trapezoidal cross sections.--.

The drawings of Okimoto, et al. clearly show weldments in Fig. 5. Fig. 5 is an expanded view of the connection between the interlocking coupler and the box beam tube. Other figures are consistent with the same kind of welded connections between the different parts of the Okimoto, et al. structures. Clearly, Okimoto, et al. is not an extruded product.

The only structure formed by the sheet piles of Okimoto et al. is illustrated as a cofferdam. Cofferdams are illustrated in Figs. 10, 11 and 12. Cofferdams are arranged in a closed shape, typically in a cylindrical shape, with the panels being driven into the earth below the water line. Once the cofferdam has been driven into the earth below the water line and the adjacent edges sealed, the water inside the cofferdam can be pumped out of the inside of the cylinder, and a concrete pier, etc. can be formed inside the cylinder. This is used in the construction of bridges and other architectural structures that span bodies of water. Lateral support of the panels of a cofferdam may be derived from the edge-to-edge engagement of the panels in the circular wall shape. Generally, there is no need to provide in Okimoto et al reinforcing flanges with space between them for access by back fill soil and/or retaining sheets since there usually is no back fill or anything else adjacent the panels of a cofferdam that provides a practical means to connect to except water on one side and space on the other side. Moreover, Okimoto et al. do not illustrate such a connection.

Claim 1 was amended to include the first and second strengthening flanges extending along the length of the structural panel and with the central wall section forming a U-shape with the opening of the U-shape facing away from the central wall section such that access is available between the strengthening flanges along the length of the structural panel. This feature provides access between the strengthening flanges to the soil that may be back-filled against the inner surface of the panel and placed in contact with the sides of the strengthening flanges, for extra lateral support of the wall structure. Also, if anchor sheets such as 62a, 62b and 62c (Fig. 5A) are to be used, access is available to attach the anchor sheets to the strengthening flanges 30, as

with anchor bars 60a, 60b and 60c. These features and advantages of applicant's invention are not disclosed or suggested by Okimoto, et al. and/or Nottingham individually or in combination.

"The Patent Office has the burden under Section 103(a) to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would *lead that individual to combine the relevant teachings of the references.*" In re Fine, 837 F.2d 1071, 5 USPQ 2d 1596, 1598 (Fed. Cir. 1988).

Okimoto, et al. shows a welded structure that is not shaped to perform as the applicant's invention. Nottingham is used to modify Okimoto et al. because Nottingham teaches a panel made of a material similar to the material of applicant's. However, it is not clear that Nottingham's material can be welded, nor is it clear that Okimoto et al. could be extruded. Therefore these references would not "lead that individual to combine the relevant teachings of the references" to applicant's invention of Claim 1.

Claims 2-6, 14 and 15 were rejected under § 103(a) as being unpatentable over Okimoto, et al. in view of Nottingham, and further in view of Papetti (5,161,917). These claims are dependent from claim 1, and claim 1 distinguishes over these references as stated above.

Further, claim 2 describes a strengthening member encased in the material and shielded from contact with the outside environment. Papetti discloses only a mesh structure of plastic coated metal wire. (Col. 2, lines 52-54.) The Papetti mesh structure is formed in the manner illustrated in Fig. 3 to form a parallelepipedic baskets known as gabions. The open mesh structure extends from the basket for the purpose of engaging the fill material that covers over the mesh structure, illustrated in Figs. 4a and 4b. Papetti does not show a product characterized by having been extruded lengthwise, as clearly set forth in the parent claim, and the mesh of Papetti is not used for strengthening purposes in a structural panel.

Claim 3 states that the strengthening member is U-shaped in cross section and is disposed in a similarly U-shaped portion of the structural panel formed by the first and second strengthening flanges and the central wall section. This is not disclosed in Papetti, individually or in combination with the other references.

Claim 4 has been amended to add the male and female locking elements being formed such that the locking elements do not protrude beyond the plane of the outer surface of the central wall section, such that when a plurality of the panels are assembled in inner locking side edge to side edge relationship to form a wall the wall will have a substantially planar outer surface without the female locking elements protruding beyond the planar outer surface. This protects the locking elements from abrasion, impact and point contact by other objects that might be floating in the adjacent water.

Claim 5 depends from claim 4 and adds the materials from which the strengthening member is comprised. The limitations of claim 5, together with the limitations of its parent claims 4, 3, 2, and 1 are not suggested or made obvious by the combination of references, including Papetti.

Claim 6 describes the secondary flanges extending from the distal edges of each of the strengthening flanges. This is not disclosed in any of the applied references. For example, Fig. 13(b) of Okimoto, et al. shows only one flange 12, does not show the first and second strengthening flanges recited in parent claim 1 and does not show the central wall section forming the U-shape with an opening facing away from the central wall section. The drawing of Okimoto et al. shows the product formed in pieces, not extruded but apparently welded together.

Claim 14 includes the limitations of its independent parent claim 1 and dependent parent claim 2, and further describes the strengthening member comprising fiberglass, being U-shaped in cross section and disposed in a similarly U-shaped portion of the structural panel. Again, this is not disclosed, suggested or made obvious by the applied references.

There is no strengthening member in either the principal or secondary reference. There is no suggestion in Papetti that an expanded metal sheet of Papetti would be used as a strengthening member encased in a structural panel. It is hind sight to use Papetti as a strengthening member in Okimoto, et al. since Okimoto, et al. is not extruded and is already made of steel. Further, it would be 20-20 hind sight to change the material of Okimoto et al. from steel to the weaker material of Nottingham and then add the expanded metal of Papetti to re-strengthen the structure.

“Prior art may not be gathered with the claimed invention in mind.” Pentec, Inc. v. Graphic Controls Corp., 776 F.2d 309, 227 USPQ 766, 768-9 (Fed. Cir. 1985).

One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to depreciate the claimed invention. In re Fine, supra.

It should be noted that Papetti is a Gabion basket that is formed by bending coated expanded metal into a basket, with the basket being used to contain stone, etc.. The baskets are used to form weights and can be stacked to become a wall, etc. This has no relevance to applicant's invention.

Claim 15 depends from 14 and states that the strengthening member is perforated. Papetti discloses coated expanded metal mesh but it is not used as a strengthening member in a U-shaped portion of a structural panel. There is no suggestion to combine Papetti and Okimoto et al.

Obviousness cannot be established by combining the teaching of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined *only* if

there is some suggestion or incentive to do so. ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d, 1572, 221 USPQ 929, 933 (Fed. Cir. 1984.).

Claim 7, dependent on claims 3, 2, and 1, is rejected under § 103(a) as being unpatentable over Okimoto, et al. in view of Nottingham and Papetti, and further in view of Cataldo (5,865,005). The rejection indicates that Okimoto, et al., Nottingham, and Papetti fail to disclose a plurality of retention apertures. Cataldo is used to disclose rearwardly extending legs or strengthening flanges 40 (Figs. 4a and 6). However, Cataldo discloses a concrete retaining wall formed of overlapping concrete blocks that are not shaped so as to be formed by extrusion, and the blocks are not shaped for driving into the soil. Cataldo requires the positioning of the block with respect to the ground that is under the wall, as shown in its Figs. 2 and 3. From a review of the Cataldo drawing it appears that a flat supporting surface such as flat ground is required to support the Cataldo blocks.

The references do not satisfy the features of parent claim 1, as described above, of the structural panel being elongated and of constant size and shape along its length and characterized by having been extruded lengthwise and having the open U-shaped strengthening flanges facing away from the wall section. There is no suggestion that Catalado's features of a concrete staggered block wall would be combined with the first three applied references.

The shape of applicant's product, such that it can be continuously formed, is not satisfied by Okimoto, et al. Applicant's continuous manufacturing feature that includes simultaneously forming the strengthening flanges provides economical advantages not offered by the applied prior art, and the claimed shape of the product provides structural advantages not available in the applied prior art. For example, the strengthening flanges with the central wall section forming a

U-shape, with the opening of the U-shape facing away from the central wall section, gives access to the spaces between the strengthening flanges. This can be used for several purposes, including encasing the strengthening member in the U-shape so as to strengthen the overall structural panel, and enabling the anchor sheet to extend between the strengthening flanges and be firmly connected thereto. Also, the structural panel has several strong areas, two formed by the locking elements at the edges of the panels and two more by the strengthening flanges intermediate the edges. In addition, the U-shaped strengthening member (of claim 2) can be added to this U-shape to add even more strength to the central portion of the panel, and soil can be placed adjacent the strengthening flanges for lateral support and the anchor bar and anchor sheet (claim 8) added to the strong central portion of the panel for lateral support. This is not obvious in view of the applied prior art.

Claim 8 is rejected under § 103(a) as being unpatentable over the several previously mentioned references, and further in view of Golcheh (6,675,547). The principal reference, Okimoto, et al., and the second, third and fourth references (Nottingham, Papetti, and Cataldo) fail to disclose an anchor sheet. Golcheh discloses stacked modules 2 (Col. 4, lines 41-52) and is used to disclose reinforcing elements 5 and a strengthening member 24, and transverse bar 31 that extends through the holes 25 of the strengthening member. Golcheh is not shaped for extrusion and apparently rests on a footing 35 and is, therefore, not subject to being driven into the soil. There is no suggestion that the features of Golcheh would be combined with the other accumulated references.

Claim 8, dependent from claims 7, 3, 2 and 1, specifies that an anchor sheet is configured to extend between the first and second strengthening flanges and be securely attached to the

anchor bar. This requires access to be available between the strengthening flanges along the length of the structural panel, as set forth in claim 1.

Claims 9 and 13 were rejected under § 103(a) as being unpatentable over Okimoto, et al. in view of Nottingham and Papetti, and further in view of Tanaka, et al. (5,364,682). Tanaka, et al. is used to disclose a composite sliding member with an impregnated metal wire mesh member. However, Tanaka, et al. is simply a coated metal wire mesh, not a structural panel, and not included in an extrusion, and not being U-shaped in cross section, and not disposed in the U-shape of the structural panel. There is no suggestion that the wire mesh of Tanaka et al. would be used as a reinforcement for the steel tube of Okimoto, et al.

Claim 10, dependent from claims 9, 3, 2 and 1, was rejected under § 103(a) as being unpatentable over Okimoto, et al. in view of Nottingham, Papetti and Tanaka, et al., and further in view of Cataldo (5,865,005). The rejection indicates that Okimoto, et al., Nottingham, Papetti, and Tanaka, et al. failed to disclose a plurality of retention apertures. Cataldo is cited to provide the apertures. Applicant acknowledges that Cataldo provides apertures. But the combined references fail to show obviousness as discussed above. For example, there is no suggestion in the combination of references of what the apertures of Cataldo in the panels of Okimoto et al. would be used for since the drawings show the Okimoto et al. panels arranged in a cofferdam that has nothing to connect to the holes.

Claims 11 and 12, dependent from claims 10, 9, 3, 2, and 1, were rejected under § 103(a) as being unpatentable over Okimoto, et al. in view of Nottingham, Papetti, Tanaka, et al., and Cataldo, as applied before, and further in view of Golcheh (6,675,547). Golcheh is used to add

an anchor sheet to the combination of the five other references. The addition of the anchor sheet does not cure the inadequacy of the other references in showing obviousness of the claims.

Claims 16-18 are method claims. These claims are rejected as unpatentable under Section 103(a) obvious over Wheeler (6,357,969) in view of Okimoto et al. and Golcheh.

Independent claim 16 describes the method of installing a driven wall structure, attaching the means for retaining the structure to the strengthening flanges of the structural panels, and disposing soil about the retaining means and adjacent the inner surfaces of the structural panels and between the strengthening flanges. As stated above, the references do not disclose or make obvious this method. As stated in the Office Action, Wheeler fails to disclose means for retaining the wall in a fixed position relative to the soils, and fails to disclose a strengthening flange. The only structure formed by the sheet piles of Okimoto et al. is illustrated as a cofferdam. Cofferdams are illustrated in Figs. 10, 11 and 12. Cofferdams are arranged in a closed shape, typically in a cylindrical shape, with the panels being driven into the earth below water. Generally, there is no need to attach a retainer to the panels of a cofferdam since there usually is nothing adjacent the panels except water on one side and space on the other side. Okimoto et al. do not disclose attaching means for retaining to the strengthening flanges of the structural panels.

Claim 19 is directed to a driven wall structure. This claim sets forth the first and second locking elements formed such that the locking elements do not protrude beyond the plane of the outer surface of the structural panel, such that when a plurality of the structural panels are assembled in interlocking side edge to side edge relationship to form the driven wall structure, the driven wall structure has a substantially planar outer surface without the locking elements

protruding beyond the planar outer surface. This feature provides an attractive exterior surface and protects the locking elements from being engaged by, and possibly damaged by, other objects. Moreover, if another structure is to be placed in abutment with the outside surface of the wall structure, such as a wale, dock, etc., the wale, etc. can make flat contact with the outside wall surface instead of point contact with the locking elements. For example, if a flat object, such as a wale, were to be placed adjacent the interlocking couplers of Okimoto, et al., there would be point contact between the flat wale and the couplers. The forces that might be applied by the flat object (the wale) would tend to be concentrated on the couplers, tending to damage the couplers.

By contrast, applicant's locking elements are formed so that they do not protrude beyond the plane of the outer surface of the structural panel, and when the panels are connected together as shown in Fig. 4, the locking elements do not protrude for inadvertent damage, abrasion, wear, etc. In addition, the strengthening flanges strengthen the panel at positions intermediate the locking elements, and the locking elements, being of greater thickness, also tend to strengthen the panels. This provides several lines of strengthening at the edges and intermediate the edges of the panels.

Claims 20 and 22-26 were rejected under § 103(a) as being unpatentable over Wheeler, Jr., et al. (6,357,969) in view of Okimoto, et al. and Golcheh, and further in view of Nottingham and Papetti and Tanaka, et al. Claim 20, dependent from 19, adds the feature of the strengthening member comprised of expanded steel. Claim 22 adds the range of dimensions of the thickness of the strengthening member; claim 23 adds the U-shape of the strengthening member being disposed in a similarly U-shaped portion of the structural panel; claim 24 adds the

strengthening member being formed of expanded metal; claim 25 adds the material from which the strengthening member is made; and claim 26 adds the first and second strengthening flange and the strengthening member of fiberglass being formed in a U-shape in cross section and disposed in the similarly U-shaped portion of the structural panel. These features do not seem to be suggested by the applied references in that the references do not apply to a structural wall panel that is shaped for continuous production and yet has the strength and protective features as described above.

Claim 21 was rejected under § 103(a) as being unpatentable over Wheeler, Jr., et al. in view of Okimoto, et al., Golcheh, Nottingham, Papetti, and Tanaka, et al., as previously applied, and further in view of Cole, et al. (4,917,543). Cole, et al. is used to disclose the material of claim 21.

Applicant submits that the multitude of combined references does not indicate obviousness of claim 21 and its parent claims 20 and 19.. The shapes and materials of applicant's claimed invention provide an improved product, one that is continuously and economically manufactured, yet provide strengthening features that provide durability and strength.

Claim 27 was rejected under § 103(a) as being unpatentable over Cole, et al. in view of Nottingham. Cole, et al. is cited for the extruded panel sections but Cole, et al. fails to disclose the panels comprising a strengthening sheet. Nottingham is cited for disclosing composite material in sheet piles which include composite materials. However, claim 27 specifies a strengthening sheet encased within the resin material. Nottingham only discloses, in paragraph

0059, the composite material, not a strengthening sheet encased within the resin material of each panel, and not having the strengthening sheet shielded from contact with the atmosphere.

Claims 28 and 29 were rejected under § 103(a) as unpatentable over Cole, et al. in view of Nottingham, and further in view of Papetti. Cole, et al. and Nottingham fail to disclose a perforated metal sheet in a composite sheet pile, and Papetti is used to supply this missing link.

However, Papetti simply discloses plastic coated metal mesh that is used to make a Gabions basket. The plastic coated metal mesh of Papetti is not encased within panels of a barrier wall. There is no suggestion that Papetti could be combined with the principal reference Cole, et al. and the secondary reference Nottingham, since Papetti does not use its plastic coated metal mesh for reinforcement purposes.

The rejection of claims 28 and 29 appears to further include Tanaka, et al. as a basis for rejection. Tanaka, et al. is stated to disclose expanded metal covered by other materials. However, Tanaka, et al., like Papetti, does not use metal wire mesh or expanded metal for being encased in a panel of a barrier wall. Tanaka, et al. is concerned with preserving the wire mesh, whereas applicant is concerned with preserving and strengthening a barrier wall.

Claims 30-32 were rejected under § 103(a) as being unpatentable over Cole, et al. in view of Nottingham and Papetti and Tanaka, et al., as previously applied, and further in view of Golcheh. Golcheh is used to disclose reinforcing elements 5 and a traverse bar 31 extending through holes 25. Claims 30-32 are dependent from claims 28 and 27. Golcheh does not remedy the inadequacies of the principal references.

New Claims 33-36

Claim 33 includes the feature of the locking elements being formed such that the locking elements do not protrude beyond the outer surface of the panel. When a plurality of the structural panels are assembled in interlocking side-edge to side-edge relationship with their outer surfaces aligned to form a straight wall with an outer surface, the locking elements do not protrude beyond the outer surface of the straight wall. As stated previously, the locking elements being recessed within the wall provides protection to the locking elements against abrasion, wear, impact, and other deterioration.

Also, the recessed locking elements allow another flat object, such as a wale mounted to the wall, a pier positioned adjacent the wall, and other flat objects to be mounted flush against the wall without point contact with the locking elements. This avoids applying forces to the locking elements and allows the force to be applied to the flat panel which is reinforced by the strengthening flanges that are formed on the inner surface of the panel.

Claim 34 adds the strengthening flanges that are open, in that the space between the flanges is open to the rear of the wall structure so that the strengthening flanges that form a strong part of the panel adjacent back fill and/or may be used for attachment of anchor sheets, bars and other devices that hold the wall structure to the land mass behind the wall structure.

Claim 35 adds the secondary strengthening flanges.

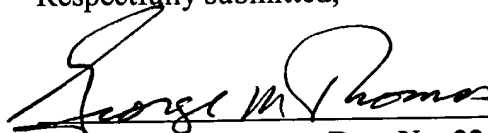
Claim 36 adds the U-shaped strengthening member.

Applicant submits that claims 33-36 are not obvious in view of the prior art of record.

SUMMARY

Applicant submits that the structural panel, wall sections and method as set forth in this application and as claimed above provide structures and functions not heretofore known in the prior art, and applicant submits that the subject matter is not obvious and should be patentable. Accordingly, favorable reconsideration of the application is courteously solicited.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "George M. Thomas", written over a horizontal line.

George M. Thomas; Reg. No. 22,260

11/11/04

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